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Search Results -

Terms	Documents
"hetherington, greg".in.	3

Database:
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EPO Abstracts Database
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IBM Technical Disclosure Bulletins

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Search History

DATE: Thursday, January 20, 2005   Printable Copy   Create Case

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DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L4	"hetherington, greg".in.	3	L4
L3	5515534.uref.	9	L3
L2	5966686.uref.	14	L2
L1	5826258.uref.	35	L1

END OF SEARCH HISTORY

☐   Generate Collection   Print

L3: Entry 5 of 9   File: USPT   Aug 7, 2001

US-PAT-NO: 6272495
DOCUMENT-IDENTIFIER: US 6272495 B1

TITLE: Method and apparatus for processing free-format data

DATE-ISSUED: August 7, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hetherington; Greg	Kareela New South Wales 2232			AU

APPL-NO: 09/ 117776   [PALM]
DATE FILED: August 6, 1998

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
AU	PP0439	April 22, 1997

PCT-DATA:

APPL-NO	DATE-FILED	PUB-NO	PUB-DATE	371-DATE	102(E)-DATE
PCT/AU98/00288	April 22, 1998	WO98/48360	Oct 29, 1998	Aug 6, 1998	Aug 6, 1998

INT-CL: [07] G06 F 17/30

US-CL-ISSUED: 707/101; 707/4, 707/102, 707/531
US-CL-CURRENT: 707/101; 707/102, 707/4, 715/531

FIELD-OF-SEARCH: 707/101, 707/1, 707/4, 707/102, 707/531, 707/541, 704/9

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected   Search ALL   Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4974191	November 1990	Amirghodsi et al.	364/900
☐	5060155	October 1991	Van Zuijlen	364/419
☐	5442780	August 1995	Takanashi et al.	395/600
☐	5454106	September 1995	Burns et al.	395/600
☐	5515534	May 1996	Chuah et al.	395/600

	5526522	June 1996	Takeuchi	395/700
	5826258	October 1998	Grupta et al.	707/4
	5963894	October 1999	Richardson et al.	704/9
	5966686	October 1999	Heidorn et al.	704/9
	6151604	November 2000	Wlaschin et al.	707/100
	6167393	December 2000	Davis, III et al.	707/3

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
WO 95/35547	December 1995	WO	
WO 96/34348	October 1996	WO	
WO 96/35183	November 1996	WO	

ART-UNIT: 212

PRIMARY-EXAMINER: Alam; Hosain T.

ASSISTANT-EXAMINER: Colbert; Ella

ATTY-AGENT-FIRM: Davis & Bujold, P.L.L.C.

ABSTRACT:

A method and apparatus for processing free-format data (301) to produce a "text object" associated with the free-format data. The text object comprises a plurality of "component nodes" (302-312) containing attribute-type identifiers for elements of the free-format text and other data facilitating access to the text object to obtain information and/or change or add the free-format data. This arrangement obviates the need for the provision of separate database fields for each element of the information. Free-format data can therefore be processed in a similar manner to the way a human being processes free-format data. All elements can be accessed via the constructed text object.

39 Claims, 22 Drawing figures

Hit List

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[Generate OACS]

Search Results - Record(s) 1 through 3 of 3 returned.

☐ 1. Document ID: US 20020010714 A1

Using default format because multiple data bases are involved.

L4: Entry 1 of 3   File: PGPB   Jan 24, 2002

PGPUB-DOCUMENT-NUMBER: 20020010714
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020010714 A1

TITLE: Method and apparatus for processing free-format data

PUBLICATION-DATE: January 24, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hetherington, Greg	Kareela		AU	

US-CL-CURRENT: 715/505; 715/508

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

☐ 2. Document ID: US 6272495 B1

L4: Entry 2 of 3   File: USPT   Aug 7, 2001

US-PAT-NO: 6272495
DOCUMENT-IDENTIFIER: US 6272495 B1

TITLE: Method and apparatus for processing free-format data

DATE-ISSUED: August 7, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hetherington; Greg	Kareela New South Wales 2232			AU

APPL-NO: 09/ 117776   [PALM]
DATE FILED: August 6, 1998

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
AU	PP0439	April 22, 1997

PCT-DATA:

APPL-NO	DATE-FILED	PUB-NO	PUB-DATE	371-DATE	102(E)-DATE
PCT/AU98/00288	April 22, 1998	WO98/48360	Oct 29, 1998	Aug 6, 1998	Aug 6, 1998

INT-CL: [07] G06 F 17/30

US-CL-ISSUED: 707/101; 707/4, 707/102, 707/531
US-CL-CURRENT: 707/101; 707/102, 707/4, 715/531

FIELD-OF-SEARCH: 707/101, 707/1, 707/4, 707/102, 707/531, 707/541, 704/9

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4974191	November 1990	Amirghodsi et al.	364/900
5060155	October 1991	Van Zuijlen	364/419
5442780	August 1995	Takanashi et al.	395/600
5454106	September 1995	Burns et al.	395/600
5515534	May 1996	Chuah et al.	395/600
5526522	June 1996	Takeuchi	395/700
5826258	October 1998	Grupta et al.	707/4
5963894	October 1999	Richardson et al.	704/9
5966686	October 1999	Heidorn et al.	704/9
6151604	November 2000	Wlaschin et al.	707/100
6167393	December 2000	Davis, III et al.	707/3

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
WO 95/35547	December 1995	WO	
WO 96/34348	October 1996	WO	
WO 96/35183	November 1996	WO	

ART-UNIT: 212

PRIMARY-EXAMINER: Alam; Hosain T.

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ATTY-AGENT-FIRM: Davis & Bujold, P.L.L.C.

ABSTRACT:

A method and apparatus for processing free-format data (301) to produce a "text object" associated with the free-format data. The text object comprises a plurality of "component nodes" (302-312) containing attribute-type identifiers for elements of the free-format text and other data facilitating access to the text object to obtain information and/or change or add the free-format data. This arrangement

obviates the need for the provision of separate database fields for each element of the information. Free-format data can therefore be processed in a similar manner to the way a human being processes free-format data. All elements can be accessed via the constructed text object.

39 Claims, 22 Drawing figures

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

☐   3.   Document ID: WO 9848360 A1

L4: Entry 3 of 3   File: EPAB   Oct 29, 1998

PUB-NO: WO009848360A1
DOCUMENT-IDENTIFIER: WO 9848360 A1
TITLE: METHOD AND APPARATUS FOR PROCESSING FREE-FORMAT DATA

PUBN-DATE: October 29, 1998

INVENTOR-INFORMATION:
NAME   COUNTRY
HETHERINGTON, GREG   AU

ASSIGNEE-INFORMATION:
NAME   COUNTRY
HETHERINGTON GREG   AU

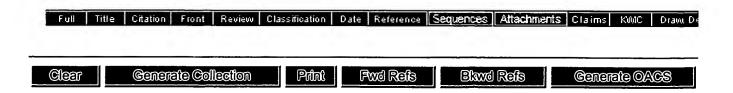APPL-NO: AU09800288
APPL-DATE: April 22, 1998

PRIORITY-DATA: AU00PP043997A (April 22, 1997)

INT-CL (IPC): G06 F 17/30; G06 F 17/20
EUR-CL (EPC): G06F017/22; G06F017/30

ABSTRACT:

CHG DATE=19990905 STATUS=C>A method and apparatus for processing free-format data (301) to produce a "text object" associated with the free-format data. The text object comprises a plurality of "component nodes" (302-312) containing attribute-type identifiers for elements of the free-format text and other data facilitating access to the text object to obtain information and/or change or add the free-format data. This arrangement obviates the need for the provision of separate database fields for each element of the information. Free-format data can therefore be processed in a similar manner to the way a human being processes free-format data. All elements can be accessed via the constructed text object.

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D |

| Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS |

Terms	Documents
"hetherington, greg".in.	3

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Previous Page   Next Page   Go to Doc#

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L3: Entry 7 of 9   File: USPT   Sep 28, 1999

US-PAT-NO: 5960430
DOCUMENT-IDENTIFIER: US 5960430 A
** See image for Certificate of Correction **

TITLE: Generating rules for matching new customer records to existing customer
records in a large database

DATE-ISSUED: September 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Haimowitz; Ira Joseph	Niskayuna	NY		
Murren; Brian Terence	Clifton Park	NY		
Lander; Henry	Niskayuna	NY		
Pierce; Barbara Ann	Slingerlands	NY		
Phillips; Mary Clarkeson	Delmar	NY		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
General Electric Company	Schenectady	NY			02

APPL-NO: 09/ 113406   [PALM]
DATE FILED: July 10, 1998

PARENT-CASE:
This application is a division of application Ser. No. 08/702,379, filed Aug. 23,
1996, which is hereby incorporated by reference in its entirety.

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 707/6; 707/1, 707/2, 707/3, 707/5
US-CL-CURRENT: 707/6; 707/1, 707/2, 707/3, 707/5

FIELD-OF-SEARCH: 707/1, 707/2, 707/3, 707/6, 707/8, 707/7, 707/10, 707/100,
707/101, 707/104, 707/200, 707/201, 707/203, 707/511, 707/532, 707/533, 707/534,
707/536, 707/541, 707/102, 707/103, 707/204, 704/7, 704/9, 706/45, 706/47, 706/50,
706/53, 706/52, 706/101, 364/274.7

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

░ Search Selected ░   ░ Search ALL ░   ░ Clear ░

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4290105	September 1981	Cichelli et al.	707/5
☐	5129082	July 1992	Tirfing et al.	707/3
☐	5202982	April 1993	Gramlich et al.	707/2
☐	5227970	July 1993	Harris	707/1
☐	5303149	April 1994	Janigian	707/6
☐	5446888	August 1995	Pyne	707/10
☐	5479654	December 1995	Squibb	707/201
☐	5481704	January 1996	Pellicano	707/5
☐	5497486	March 1996	Stolfo et al.	707/7
☐	5515534	May 1996	Chuah et al.	707/101
☐	5583778	December 1996	Wind	705/34
☐	5604910	February 1997	Kojima et al.	707/3
☐	5619709	April 1997	Caid et al.	707/532
☐	5706497	January 1998	Takahashi et al.	707/5
☐	5724593	March 1998	Hargrave, III et al.	704/7

OTHER PUBLICATIONS

"SSA-Name An Introduction", Search Software America, Old Greenwich, CT, Version 1.6, Oct. 1, 1994, pp. 1-24.
"The Field Matching Problem: Algorithms And Applications" By AE Monge, Et Al, Second International Conference On Knowledge Discovery And Data Mining, Aug. 2, 1996, AAA1 Press, Menlo Park, Ca, pp. 267-270.
"The Merge/Purge Problem for Large Databases" by MA Hernandez, et al, Proceedings of the ACM Sigmoid International Conference on Management of Data (May 1995), pp. 1-35.

ART-UNIT: 276

PRIMARY-EXAMINER: Amsbury; Wayne

ASSISTANT-EXAMINER: Channavajjala; Srirama

ATTY-AGENT-FIRM: Goldman; David C. Breedlove; Jill M.

ABSTRACT:

A method and system for matching new customer records to existing customer records in a database. The new customer records are validated for quality and normalized into a standard form. A hash key is selected to generate a candidate set of records from the existing records in the database that likely matches the new customer records. The new customer records are then matched to each of the records in the candidate set. Once the matching has been performed, a decision is made on whether to create a new customer record, update an existing record, or save the new record in a pending file for resolution at a later time. In another embodiment, there is a methodology for learning matching rules for matching records in a database. The matching rules are then used for matching a new customer record to existing records in a database.

10 Claims, 6 Drawing figures

☐ ▮Generate Collection▮   ▮Print▮

L3: Entry 7 of 9   File: USPT   Sep 28, 1999

US-PAT-NO: 5960430
DOCUMENT-IDENTIFIER: US 5960430 A
** See image for Certificate of Correction **

TITLE: Generating rules for matching new customer records to existing customer
records in a large database

DATE-ISSUED: September 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Haimowitz; Ira Joseph	Niskayuna	NY		
Murren; Brian Terence	Clifton Park	NY		
Lander; Henry	Niskayuna	NY		
Pierce; Barbara Ann	Slingerlands	NY		
Phillips; Mary Clarkeson	Delmar	NY		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
General Electric Company	Schenectady	NY			02

APPL-NO: 09/ 113406   [PALM]
DATE FILED: July 10, 1998

PARENT-CASE:

This application is a division of application Ser. No. 08/702,379, filed Aug. 23,
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INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 707/6; 707/1, 707/2, 707/3, 707/5
US-CL-CURRENT: 707/6; 707/1, 707/2, 707/3, 707/5

FIELD-OF-SEARCH: 707/1, 707/2, 707/3, 707/6, 707/8, 707/7, 707/10, 707/100,
707/101, 707/104, 707/200, 707/201, 707/203, 707/511, 707/532, 707/533, 707/534,
707/536, 707/541, 707/102, 707/103, 707/204, 704/7, 704/9, 706/45, 706/47, 706/50,
706/53, 706/52, 706/101, 364/274.7

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4290105	September 1981	Cichelli et al.	707/5
☐	5129082	July 1992	Tirfing et al.	707/3
☐	5202982	April 1993	Gramlich et al.	707/2
☐	5227970	July 1993	Harris	707/1
☐	5303149	April 1994	Janigian	707/6
☐	5446888	August 1995	Pyne	707/10
☐	5479654	December 1995	Squibb	707/201
☐	5481704	January 1996	Pellicano	707/5
☐	5497486	March 1996	Stolfo et al.	707/7
☐	5515534	May 1996	Chuah et al.	707/101
☐	5583778	December 1996	Wind	705/34
☐	5604910	February 1997	Kojima et al.	707/3
☐	5619709	April 1997	Caid et al.	707/532
☐	5706497	January 1998	Takahashi et al.	707/5
☐	5724593	March 1998	Hargrave, III et al.	704/7

OTHER PUBLICATIONS

"SSA-Name An Introduction", Search Software America, Old Greenwich, CT, Version
1.6, Oct. 1, 1994, pp. 1-24.
"The Field Matching Problem: Algorithms And Applications" By AE Monge, Et Al,
Second International Conference On Knowledge Discovery And Data Mining, Aug. 2,
1996, AAA1 Press, Menlo Park, Ca, pp. 267-270.
"The Merge/Purge Problem for Large Databases" by MA Hernandez, et al, Proceedings
of the ACM Sigmoid International Conference on Management of Data (May 1995), pp.
1-35.

ART-UNIT: 276

PRIMARY-EXAMINER: Amsbury; Wayne

ASSISTANT-EXAMINER: Channavajjala; Srirama

ATTY-AGENT-FIRM: Goldman; David C. Breedlove; Jill M.

ABSTRACT:

A method and system for matching new customer records to existing customer records
in a database. The new customer records are validated for quality and normalized
into a standard form. A hash key is selected to generate a candidate set of records
from the existing records in the database that likely matches the new customer
records. The new customer records are then matched to each of the records in the
candidate set. Once the matching has been performed, a decision is made on whether
to create a new customer record, update an existing record, or save the new record
in a pending file for resolution at a later time. In another embodiment, there is a
methodology for learning matching rules for matching records in a database. The
matching rules are then used for matching a new customer record to existing records
in a database.

10 Claims, 6 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 6

BRIEF SUMMARY:

1   BACKGROUND OF THE INVENTION

2   The present invention relates generally to databases, and more particularly to
       matching new customer records to existing customer records in a large business
       database.

3   A large business database often has duplications of the same customer records.
       The duplications are likely due to misspelling errors or because of multiple
       methods of entering the customer records into the database. These duplications
       result in several problems for the end-user. One problem is that a customer
       whose records have been duplicated may receive multiple mailings from the end-
       user. Another problem is that the end-user may not ever have consistent
       information about each customer. The customer information may be inconsistent
       because every time the customer record has to be updated, only one record is
       updated. There is no assurance that the most recently updated record will be
       revised, which results in inconsistent information. A third problem with
       duplicated records, is that the end-user is unable to determine how much
       business activity has been generated by a particular customer. retrieval
       systems. These library-style catalogue retrieval systems can search a large
       database of records to find matches that are similar to a query entered by an
       end-user. Typically, these library-style catalogue retrieval systems use
       phonetic-based algorithms to determine the closeness of names or addresses or
       word strings. A problem with these library-style catalogue retrieval systems
       is that they are only useful for searching through an existing customer
       database and are unable to compress a large customer database having multiple
       repetitions of customer records. Therefore, there is a need for a methodology
       that processes new customer records, checks the new records for poor quality,
       normalizes and validates the new records, and matches the new records to
       existing customer records in order to determine uniqueness. Normalizing,
       validating, and matching the customer records will allow an end-user to avoid
       wasted mailings, maintain consistent information about each customer, and
       determine how much business activity has been generated by a particular
       customer.

4   SUMMARY OF THE INVENTION

5   Therefore, it is a primary objective of the present invention to provide a
       method and system that normalizes and validates new customer records, and
       matches the new records to existing customer records in a large database.

6   Another object of the present invention is to enable end-users of large
       business databases to avoid wasted mailings, maintain consistent information
       about each of their customers, and determine how much business activity has
       been generated by a particular customer.

7   Thus, in accordance with the present invention, there is provided a method and
       a system for matching a new data set containing a record and a collection of
       fields to an existing data set in a database containing a plurality of records
       each having a collection of fields. In this embodiment, the new data set is
       initially read. Each of the fields from the record in the new data set are
       then validated. The validated fields in the record in the new data set are

then normalized into a standard form. Next, a hash key is selected for generating a candidate set of records from the existing data set in the database that likely matches the record from the new data set. The hash key is then applied to the plurality of records in the existing data set of the database to generate the candidate set of records. The record from the new data set is then matched to each of the records in the candidate set. The existing data set in the database is then updated according to the results of the match between the record from the new data set to the records in the candidate set.

8   In accordance with another embodiment of the present invention, there is provided a method and system for generating rules for matching data in a database containing a plurality of records each having a collection of fields. In this embodiment, a sample of training data is obtained from the database. Similar pairs of records from the sample of training data are then identified. Field matching functions are applied to each of the corresponding fields in the similar pairs of records. Each field matching function generates a score indicating the strength of the match between items in the field. An intermediate file of vectors containing matching scores for all of the fields from each of the similar pair of records is then generated. The intermediate file of vectors are then converted into a plurality of matching rules for matching data in the database. The plurality of matching rules can then be used for matching a new data set containing a record and a collection of fields to an existing data set in a database containing a plurality of records each having a collection fields.

9   While the present invention will hereinafter be described in connection with a preferred embodiment and method of use, it will be understood that it is not intended to limit the invention to this embodiment. Instead, it is intended to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the present invention as defined by the appended claims.

DRAWING DESCRIPTION:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a system for data validation and matching according to the present invention;

FIG. 2 is a flow chart describing the data validation and matching according to the present invention;

FIG. 3 is an example of a fixed general business file format that may be used in the present invention;

FIG. 4 is flow chart describing the matching process in more detail;

FIG. 5 is a screen view of an interface used for the matching process; and

FIG. 6 discloses a flow chart describing the process of examining pending data for a match.

DETAILED DESCRIPTION:

1   DETAILED DESCRIPTION OF THE PRESENT INVENTION

2   The present invention discloses a data validation and matching tool for

processing raw business data from large business databases. The raw business data includes a plurality of records each having a collection of fields and attributes. A block diagram of a system 10 for performing data validation and matching according to the present invention is shown in FIG. 1. The system 10 includes a database of existing customer records 12 and a database of new customer records 14. The database of existing customer records 12 can be a large database containing over 200,000 records. Each record has a collection of fields and attributes that are applicable for the particular business application. For example, some of the fields that may be used are business name, customer name, address, country, phone number, business codes, etc. The database of new customer records 14 can be as small as one record or as large as over 200,000 records. These records also have a collection of fields and attributes that are applicable to the business application.

3   The system 10 also includes a computer such as a workstation or a personal computer. A representation of the functions performed by the computer are shown as blocks 16, 18, 20, and 22. In particular, a validation and normalization block 16 reads the data from the new records database 14 and checks the fields in each record for quality and normalizes the field information into a standard form. If the data is good, then a hash key selector 18 selects a hash key. Note that there may be one or more hash keys. A matcher 20 uses the hash key to select a set of candidates from all of the existing records in the database 12 with the same hash key. For example, the present invention will generate about 100 candidates for a 50,000 record database. The matcher 20 performs a matching operation between a new data record from database 14 and each member of the candidate set. The matching operation, which is described below in further detail, creates a list of potential matches. If multiple hash keys are used, then the process will retrieve records based on a disjunction of the hash keys. However, once all the matching is done, the matcher 20 makes a decision whether to create a new customer record in database 12, update an existing record in database 12, or save the new data in a pending file 22 for resolution at a later time.

4   FIG. 2 is flow chart describing the operation of the data validation and matching according to the present invention. The operation begins by reading raw data from a record at 24. The data from the record is validated for quality and standardized into a standard form at 26. Hash keys are selected at 28 by the hash key selector 18. At 30, a set of candidates from all of the existing records in the database 12 with the same hash key are retrieved. The matching operation is then performed at 32 between the new data record and each member of the candidate set, resulting in a list of potential matches. Based on the matching results, block 34 creates either a new record in database 12, or updates an existing record in database 12, or places the new record in a pending file for resolution at a later time. If there are more records in the raw data file at 36, then the next record is read and the steps at 26, 28, 30, 32, and 34 are repeated. The operation ends once there are no more records to be processed.

5   Before validation and normalization, the raw data file from the new records is read. In the present invention, the data can arrive from many different hardware/software systems ranging from an off-the-shelf spreadsheet application to a mainframe dump that is in a fixed "General Business File" format. An example of a fixed general business file format 38 is shown in FIG. 3. The business file format includes a field number, field name, width of the field, and description of the field. Note that the business file format in FIG. 3 is only an example of possible fields and can change depending upon the particular business application. For instance, files of hospital patients may include patient name, date of birth, hospital ID, and patient sex.

DB-Entry 9 of 9   File: USPT   Apr 14, 1998

US-PAT-NO: 5740421
DOCUMENT-IDENTIFIER: US 5740421 A

TITLE: Associative search method for heterogeneous databases with an integration
mechanism configured to combine schema-free data models such as a hyperbase

DATE-ISSUED: April 14, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Palmon; Eran	Tel Aviv			IL

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
DTL Data Technologies Ltd.	Tel-Aviv			IL	03

APPL-NO: 08/ 415601   [PALM]
DATE FILED: April 3, 1995

INT-CL: [06] A06 F 17/30

US-CL-ISSUED: 395/604; 395/603, 395/611, 395/612, 395/613
US-CL-CURRENT: 707/4; 707/100, 707/101, 707/102, 707/3

FIELD-OF-SEARCH: 395/600, 395/611, 395/612, 395/613, 395/604, 395/603

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
5416917	May 1995	Adair et al.	395/500
5481703	January 1996	Kato	395/600
5515534	May 1996	Chuah et al.	395/612

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ART-UNIT: 237

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Robinson; Greta L.

ATTY-AGENT-FIRM: Rosenfeld; Dov

ABSTRACT:

A method of performing an associative search on a set of heterogeneous databases is
described, the method implemented on a general purpose computer. The method
comprises converting each database of the set of databases into a schema-free
structure called a hyperbase. The hyperbases corresponding to each database of the
set of databases are combined into a single combined hyperbase, and that single
hyperbase is normalized into a single normalized hyperbase. An associative search
on the single hyperbase includes providing a set of input words. The method of the
present invention determines an answer, which is that sub-hyperbase of the
hyperbase to be searched which has minimum "cost" according to a criterion. Once an
answer is determined, the answer is displayed to the user.

88 Claims, 22 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 11

BRIEF SUMMARY:

1   MICROFICHE APPENDIX

2   A 68-page microfiche appendix consisting of one sheet and 57 frames microfiche
     is submitted as part of this application and incorporated herein.

3   The computer programs in the microfiche appendix are copyright DTL Data
Technologies Ltd.

4   COPYRIGHTED MATERIAL

5   A portion of the disclosure of this patent document contains material which is
subject to copyright protection. The copyright owner has no objection to the
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records, but otherwise reserves all copyright rights whatsoever.

6   BACKGROUND OF THE INVENTION

7   A. Field of the Invention

8   The field of the present invention is searching heterogeneous database systems
and other systems for maintaining information in computers.

9   B. Some Definitions

10   The present invention deals with maintaining information, where information is
anything that can be displayed to and that is comprehensible to humans and
maintaining information is carrying out on a computer the necessary processes
for storing, retrieving, and manipulating information. In particular, the
present invention deals with retrieving information.

11   The present invention is applicable to all information, including textual and
pictorial information. Textual information is data that can be spoken. Such
data is stored in words, where a word is a list of characters. While
embodiments of the present invention are described for textual information,
extension to other types of information would be apparent to one skilled in
the art.

12   Textual data can be either natural language text, consisting of words that are
arranged in sentences with natural grammar rules, or formatted data text (also
called row data text), consisting of words that are arranged in data
structures such as tables, trees, sets of tables, lists of records, etc.

13   The art of databases deals with all aspects of maintaining such formatted
data, including storage on disks, concurrency control, etc. The method of
present invention involves searching information, and deals with the
structural aspects of databases: the methods of (logically) representing
information using computers, defining a query on databases, and displaying
information.

14   A data-model is a generic data structure such as a table. For example, a
relational data model is a set of tables, where a table is a set of rows, each
with the same number of columns, all rows in a particular column sharing the
same attribute. Each table typically is "a file", each row of a table is "a
record of the file" each column in a row is a "field of a record" and each
column having its particular attributes--"the attributes of the field."

15   A schema, defined with reference to a particular data model, is an instance of
the particular data model, with parameters provided to the data model and
words associated to the data model and its attributes. For example, a schema
can be a table defined to have some fixed number of columns, a table name, and

the attributes of the columns. For example, FIG. 3 shows a relational model consisting of two tables, EMPLOYEES and SALARIES. The schema for this relational model is as follows. The first table 301 is called EMPLOYEES and has two columns, the first column 303 is called ID and the other column 305 is called NAME. That is, the first column has the attribute 307 ID and the second has attribute 309 NAME. Each row (or record) of the table consists of a number for an employee (in the ID column) and the employee's name (in the NAME column). The second table 311 is called SALARIES and has three columns, having attributes ID, 1993 and 1994 denoted in FIG. 3 by 313, 315, and 317, respectively. Each record of SALARIES consists of a number for an employee (in the ID column), that employee's salary for 1993 (in the 1993 column) and that employee's salary for 1994 (in the 1994 column).

16   A database instance is an instance of a schema with the schema's parameters set. For example, if the schema is a table defined to have some fixed number of columns, a table name, with each of the columns having some attributes, then the instance would have a particular number of rows (or records) and the table's elements would have words associated to them. For the above schema for the relational model consisting of the tables EMPLOYEES and SALARIES, FIG. 3 shows the database with EMPLOYEES having two rows (or records), the first 319 having ID 001 and NAME John Smith and the second 321 having ID 002 and NAME Mary Lu, and SALARIES having one row 323 having ID 001, 1993 $73,000 and 1994 $80,000. This database is referred to below as PERSONNEL.

17   A query is a function, that is, a mapping, from a particular database into a substructure of the database. That substructure is called the answer of the query. The answer has particular parameters (words) that may be both from the schema of the database and from the data itself. Thus an answer can be viewed as an instance of a data structure.

18   For example, the following defines a query on PERSONNEL: select ID and 1993 from SALARIES where ID=001

19   This would provide an answer consisting of a table with two columns having attributes ID and 1993, respectively. These are from the attributes of the schema of PERSONNEL. The answer table would have one row consisting of 001 in column ID and $73,000 in column 1993. The contents of the row are from the data of database PERSONNEL.

20   In this specification, a note refers to a list of lines of words. Thus, an unstructured (except for lines) block of text is a note.

21   A grid is a structure which can store grid-like items of information, for example, a spreadsheet. A grid can thus be thought of as a table where both the columns and rows have attributes (i.e., names). This is slightly different from a table in a relational database, where only columns have attributes or names, and each row is a record.

22   A thesaurus is a set of phrases, where each phrase is a set of words. The phrases in a thesaurus entry typically each have similar meaning. In most cases, the phrases will consist of one word only, in which case a thesaurus is a list of words that have similar meaning.

23   A stem is similar to a thesaurus in that it consists of a set of words. In this case, the words are all morphological variants of the same root. For example, a stem might contain the words salaries and salary.

24   A grouped structure is a set of some of the above structures, with a name

given to the set of structures to indicate that the set's component structures are all grouped together under that name.

25   An associative search is a query that takes a set of words (a phrase) as input and determines output which consists of a set of answers, sorted by relevance, where each answer is as defined above; an answer can be viewed as a set of phrases from the database or databases being searched.

26   The method of the present invention involves carrying out an associative search simultaneously on several heterogeneous databases. That is, on data which may be spread over several different database management systems. These systems may be incompatible with each other, use different data structures, and have their own different query languages. These systems might include relational data, notes, thesauri, stems, and/or grouped structures.

27   The method of the present invention is not limited to the data structures defined above, and may by extended easily to include other types of structures. How to carry out such an extension would be clear to one in the art from the present specification.

28   C. Description and Shortcomings of Prior Art Methods

29   The present invention describes a method for performing associative searches of several heterogeneous databases. The method overcomes many of the shortcomings of the prior art methods for searching heterogeneous databases. Some of the shortcomings include: the need for programming and database know-how, the need for database structure and data formatting, the need for common representations to enable integrating data from different databases, the difficulty in performing a "fuzzy" search and the difficulty in using ambiguous data.

30   Need for programming and database know-how

31   Typically, to perform a successful query on a database, one needs to have programming skills. To perform a query, a conceptual description of the query, for example, the query request expressed in everyday language, needs to be translated into a list of instructions for the computer to carry out the request. The conversion is typically not unique, and requires specific knowledge about the database and some know-how. Typically, the person carrying out the request needs to be a computer programmer. The cost of any query is thus high.

32   As an example, in the case of relational databases, one needs to know which files exist, what the files' names are, and what the fields and their corresponding attributes are for each file. In addition, one needs to be familiar with the concepts of selecting records from a table, joining two tables and projecting fields. Finally, one needs to be familiar with a query language such as SQL or some other relational query system.

33   Previous attempts at overcoming the programming know-how barrier to using databases include systems that help a user navigate through the schema to create a query, say an SQL query. This navigation process takes time, and still requires the user to understand the concepts of relational databases and the operations one can perform on them.

34   The present invention uses a data-model with no schema. Hence, a user does not need to know attributes (such as fields) to distinguish these from data

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L1: Entry 33 of 35   File: USPT   Aug 10, 1999

US-PAT-NO: 5937407
DOCUMENT-IDENTIFIER: US 5937407 A

TITLE: Information retrieval apparatus using a hierarchical structure of schema

DATE-ISSUED: August 10, 1999

INVENTOR-INFORMATION:
NAME   CITY   STATE   ZIP CODE   COUNTRY
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ASSIGNEE-INFORMATION:
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Digital Vision Laboratories Corporation   JP   03

APPL-NO: 08/ 989206   [PALM]
DATE FILED: December 11, 1997

FOREIGN-APPL-PRIORITY-DATA:
COUNTRY   APPL-NO   APPL-DATE
JP   8-332279   December 12, 1996

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 707/100; 707/3, 707/4, 707/101, 707/102
US-CL-CURRENT: 707/100; 707/101, 707/102, 707/3, 707/4

FIELD-OF-SEARCH: 707/1-3, 707/100-103, 706/45, 706/46, 706/50, 706/55, 706/902,
706/934

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected   Search ALL   Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	5339256	August 1994	Levy et al.	706/911
☐	5768578	June 1998	Kirk et al.	707/100
☐	5778373	July 1998	Levy et al.	707/100
☐	5826258	October 1998	Gupta et al.	707/4

OTHER PUBLICATIONS

Microsoft Press Computer Dictionary, Second Edition, 1994, pp. 156-157, 344-345, Dec. 1994.

ART-UNIT: 271

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Alam; Hosain T.

ATTY-AGENT-FIRM: Christensen O'Connor Johnson & Kindness PLLC

ABSTRACT:

An information retrieving apparatus comprises a retrieve instruction executing means for executing a retrieve instruction based on a retrieval formula described based on an arbitrary schema, a schema conversion means for converting the retrieval formula into another retrieval formula according to another schema based on pregiven rules, and a schema management means for managing the rules for converting the retrieval formula into the other retrieval formula, wherein the retrieve instruction executing means retrieves desired information based on the other retrieval formula. In this case, preferred embodiments are as follows.

8 Claims, 6 Drawing figures

First Hit   Fwd Refs   Previous Doc   Next Doc   Go to Doc#

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L1: Entry 33 of 35   File: USPT   Aug 10, 1999

US-PAT-NO: 5937407
DOCUMENT-IDENTIFIER: US 5937407 A

TITLE: Information retrieval apparatus using a hierarchical structure of schema

DATE-ISSUED: August 10, 1999

INVENTOR-INFORMATION:

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ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Digital Vision Laboratories Corporation				JP	03

APPL-NO: 08/ 989206   [PALM]
DATE FILED: December 11, 1997

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	8-332279	December 12, 1996

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 707/100; 707/3, 707/4, 707/101, 707/102
US-CL-CURRENT: 707/100; 707/101, 707/102, 707/3, 707/4

FIELD-OF-SEARCH: 707/1-3, 707/100-103, 706/45, 706/46, 706/50, 706/55, 706/902, 706/934

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected   Search ALL   Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	5339256	August 1994	Levy et al.	706/911
☐	5768578	June 1998	Kirk et al.	707/100
☐	5778373	July 1998	Levy et al.	707/100
☐	5826258	October 1998	Gupta et al.	707/4

OTHER PUBLICATIONS

Microsoft Press Computer Dictionary, Second Edition, 1994, pp. 156-157, 344-345,
Dec. 1994.

ART-UNIT: 271

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Alam; Hosain T.

ATTY-AGENT-FIRM: Christensen O'Connor Johnson & Kindness PLLC

ABSTRACT:

An information retrieving apparatus comprises a retrieve instruction executing
means for executing a retrieve instruction based on a retrieval formula described
based on an arbitrary schema, a schema conversion means for converting the
retrieval formula into another retrieval formula according to another schema based
on pregiven rules, and a schema management means for managing the rules for
converting the retrieval formula into the other retrieval formula, wherein the
retrieve instruction executing means retrieves desired information based on the
other retrieval formula. In this case, preferred embodiments are as follows.

8 Claims, 6 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 4

BRIEF SUMMARY:

1   BACKGROUND OF THE INVENTION

2   The present invention relates to an information retrieving apparatus such as
     commodity information which has been built into databases in various formats
     for description and, more particularly, to an information retrieving apparatus
     on various commodities provided by different providers on a communication
     basis, e.g., over the Internet.

3   Recently, selling by correspondence utilizing virtual shopping malls or
     shopping pages provided over computer communication or the Internet has been
     holding the spotlight.

4   However, consumers who purchase commodities through such shopping malls or
     shopping pages have problems such as inability to find commodities that they
     are looking for. Providers who provide commodities have a problem that their
     customers do not visit their shops (or the customers do not access their home
     pages). The term "commodities" implies here not only material commodities but
     also immaterial commodities. For example, in the case of a commodity provider
     who is a broadcaster, the commodity is services such as programs that it
     broadcasts.

5   Among the above-described problems, the inability to find commodities as a
     problem at the consumers' side refers to situations as described below.

6   It refers to a situation wherein one can not find a program that broadcasts a
     piece of music he or she wishes to listen to from among programs for broadcast

or a situation wherein one can not find a movie film that he or she wishes to watch to see a certain actor performing because a program table shows only general information. It further refers to such a situation that one can not find a home page that sells a certain commodity that he or she looks for over the Internet.

7   From the providers' point of view, referring to current retrieval services in the Internet as an example, there is a problem in that a new WWW (World Wide Web) site opened on the Internet can not be found by consumers because the services employ a system in which commodities are accessed from the consumers' side.

8   Conventional retrieval services in the Internet will now be specifically examined.

9   When a user searches information on the WWW, in general, the user retrieves information by passing keywords for retrieval services to, for example, a retrieval engine or the like. However, since such retrieval services handle an enormous number of WWW pages, too many results of retrieval can be provided or irrelevant pages can be returned unless the keywords are specified properly. This is significant especially in the case of retrieval of commodities for on-line shopping.

10   For example, let us assume here that pages of on-line shopping on the WWW are searched in an attempt to purchase a red polo shirt from a certain manufacturer. Then, the user carries out retrieval by specifying "polo shirt", "manufacturer name" and "red" as keywords, but results of retrieval are returned including many irrelevant pages such as a page that introduces jeans from the relevant manufacturer and polo shirts from other manufactures and an essay on polo shirts from Ralph Lauren which is irrelevant to the intention of the user to purchase.

11   On the contrary, retrieval using keywords provided by retrieval services searches only WWW pages including keywords that coincide with the input, and it is not necessarily possible to find pages which seem to be relevant. Specifically, as shown in FIG. 1, retrieval in search of a commodity named "Blade Runner" can return only data which conform to all of keywords "commodity name" and "Blade Runner" as a result of retrieval (only the data indicated by the solid line in FIG. 1). Therefore, the WWW pages including information "Title: Blade Runner" or "Title in Japanese: Blade Runner" indicated by the dotted lines in FIG. 1 can not be obtained as a result of retrieval. Thus, it is not necessarily possible to retrieve desired information using keywords.

12   As described above, since current retrieval of commodities is carried out on a full test basis, there are problems in that a result of retrieval can include many irrelevant things and in that a desired commodity can not be found.

13   The above-described problems result from a fact that keywords to be retrieved are associated with pages instead of commodities and a fact that keywords are extracted from words that appear on pages and therefore the intentions of information providers that are not written on the pages (e.g., whether the pages are intended for selling or introduction) are not the object of retrieval. In order to solve such problems and to allow a user to utilize retrieval services intuitively, it is desirable to perform retrieval based on the features of commodities registered by information providers instead of keywords that are automatically extracted.

14   BRIEF SUMMARY OF THE INVENTION

15   It is an object of the invention to provide an information retrieving apparatus which allows consumers to retrieve desired commodity information quickly and easily and consequently allows providers to present consumers with commodities that they can provide to consumers without special efforts.

16   The present invention includes means as described below provided to solve the above-described problems.

17   An information retrieving apparatus according to as aspect of the invention comprises a retrieve instruction executing means for executing a retrieve instruction based on a retrieval formula described based on an arbitrary schema; a schema conversion means for converting the retrieval formula into another retrieval formula according to another schema based on pregiven rules; and a schema management means for managing the rules for converting the retrieval formula into the other retrieval formula, wherein the retrieve instruction executing means retrieves desired information based on the other retrieval formula. In this case, preferred embodiments are as follows.

18   (1) The apparatus further comprises a data base for storing retrieval object information, in which the retrieval object information consists of a pair of attribute data and a value.

19   (2) The retrieve instruction executing means retrieves desired information based on the retrieval formula and the other retrieval formula.

20   (3) The schema management means manages attribute information of at least one schema using a hierarchical structure.

21   (4) when the retrieval by the retrieve instruction executing means does not provide the desired information, the schema conversion means converts the layer of the attribute information into the layer above it and wherein the retrieve instruction executing means executes retrieval based on the result of the conversion.

22   (5) The retrieve instruction executing means retrieves information stored in at least one database connected through a network.

23   An information retrieving apparatus according to another aspect of the invention comprises a meta-data storage section for storing meta-data stored in various formats; a schema declaration section for extracting a schema associated with meta-data for each of predetermined items of information from meta-data stored in the meta-data storing section to define a method of describing attributes; and a relation declaration section for defining a hierarchical relation between the attributes defined by the schema declaration section and attributes of other schemata. With this configuration, the apparatus further comprises a core attribute hierarchy declaration section in which a general hierarchical relation between attributes is described.

24   According to the present invention, retrieval is carried out after performing a conversion into a desired schema using schema hierarchy constituted by layers between which each attribute is related. As a result, unnecessary information will not be retrieved, and desired commodity information can be quickly and easily retrieved even if the required information is ambiguously specified.

25   Additional objects and advantages of the present invention will be set forth
      in the description which follows, and in part will be obvious from the
      description, or may be learned by practice of the present invention. The
      objects and advantages of the present invention may be realized and obtained
      by means of the instrumentalities and combinations particularly pointed out in
      the appended claims.

DRAWING DESCRIPTION:

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of the
specification, illustrate presently preferred embodiments of the present invention
and, together with the general description given above and the detailed description
of the preferred embodiments given below, serve to explain the principles of the
present invention in which:

FIG. 1 illustrates an example of retrieval using keywords according to the prior
art;

FIG. 2 shows a schematic configuration of a retrieving apparatus according to an
embodiment of the invention;

FIGS. 3A and 3B illustrate operations of the retrieving apparatus according to the
embodiment of the invention;

FIG. 4 illustrates an example of data (meta-data) included in a schema management
section 3; and

FIG. 5 shows a schematic configuration of an apparatus for creating the meta data
shown in FIG. 4.

DETAILED DESCRIPTION:

1   DETAILED DESCRIPTION OF THE INVENTION

2   An embodiment of the present invention will now be described with reference to
      the accompanying drawings.

3   FIG. 2 shows a schematic configuration of a retrieving apparatus according to
      an embodiment of the invention.

4   The retrieving apparatus according to the invention comprises a retrieve
      instruction executing section 1, a schema conversion section 2 and a schema
      management section 3. Referring to FIG. 2, a database 4 stores information
      and, for example, it may be a WWW site on the Internet or a database in the
      intranet.

5   The retrieve instruction executing section 1 retrieves desired data from the
      database 4 in response to a retrieve instruction.

6   The schema conversion section 2 converts a retrieve instruction input to the
      retrieve instruction executing section 1 into a retrieve instruction which
      makes it possible to obtain the desired information.

7   The schema management section 3 manages association of a predetermined schema

WEST Search History

| Hide Items | Restore | Clear | Cancel |

DATE: Wednesday, January 19, 2005

Hide?	Set Name	Query	Hit Count
		DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR	
☐	L30	5966686.pn.	2
☐	L29	5826258.pn.	2
☐	L28	5454106.pn.	2
☐	L27	5515534.pn.	2
☐	L26	L25 and grammar near rules	22
☐	L25	L23 amd phonetic near value	22742
☐	L24	L23 amd phonetic with value	23017
☐	L23	L22 and nodes	58
☐	L22	L21 and (hierarch$ or hierarchy or hierarchical)	93
☐	L21	L20 and character with length	227
☐	L20	L19 and value	2543
☐	L19	text near object	3658
☐	L18	707/513	2325
☐	L17	707/531	870
☐	L16	707/541	145
☐	L15	717/107	290
☐	L14	715/541	142
☐	L13	715/531	927
☐	L12	715/513	2094
☐	L11	704/8	727
☐	L10	704.clas.	18155
☐	L9	717.clas.	7769
☐	L8	715.clas.	20232
☐	L7	707.clas.	24557
☐	L6	707/100	5679
☐	L5	707/4	4178
☐	L4	707/3	7683
☐	L3	707/101	3734
☐	L2	707/9	2502
☐	L1	707/1	7370

END OF SEARCH HISTORY

☐ ▨▨▨ Generate Collection ▨▨▨   ▨ Print ▨

L26: Entry 21 of 22   File: USPT   Aug 7, 2001

US-PAT-NO: 6272495
DOCUMENT-IDENTIFIER: US 6272495 B1

TITLE: Method and apparatus for processing free-format data

DATE-ISSUED: August 7, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hetherington; Greg	Kareela New South Wales 2232			AU

APPL-NO: 09/ 117776   [PALM]
DATE FILED: August 6, 1998

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
AU	PP0439	April 22, 1997

PCT-DATA:

APPL-NO	DATE-FILED	PUB-NO	PUB-DATE	371-DATE	102(E)-DATE
PCT/AU98/00288	April 22, 1998	WO98/48360	Oct 29, 1998	Aug 6, 1998	Aug 6, 1998

INT-CL: [07] G06 F 17/30

US-CL-ISSUED: 707/101; 707/4, 707/102, 707/531
US-CL-CURRENT: 707/101; 707/102, 707/4, 715/531

FIELD-OF-SEARCH: 707/101, 707/1, 707/4, 707/102, 707/531, 707/541, 704/9

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

▨▨▨ Search Selected ▨▨▨   ▨ Search ALL ▨   ▨ Clear ▨

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4974191	November 1990	Amirghodsi et al.	364/900
☐	5060155	October 1991	Van Zuijlen	364/419
☐	5442780	August 1995	Takanashi et al.	395/600
☐	5454106	September 1995	Burns et al.	395/600
☐	5515534	May 1996	Chuah et al.	395/600

☐	5526522	June 1996	Takeuchi	395/700
☐	5826258	October 1998	Grupta et al.	707/4
☐	5963894	October 1999	Richardson et al.	704/9
☐	5966686	October 1999	Heidorn et al.	704/9
☐	6151604	November 2000	Wlaschin et al.	707/100
☐	6167393	December 2000	Davis, III et al.	707/3

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
WO 95/35547	December 1995	WO	
WO 96/34348	October 1996	WO	
WO 96/35183	November 1996	WO	

ART-UNIT: 212

PRIMARY-EXAMINER: Alam; Hosain T.

ASSISTANT-EXAMINER: Colbert; Ella

ATTY-AGENT-FIRM: Davis & Bujold, P.L.L.C.

ABSTRACT:

A method and apparatus for processing free-format data (301) to produce a "text object" associated with the free-format data. The text object comprises a plurality of "component nodes" (302-312) containing attribute-type identifiers for elements of the free-format text and other data facilitating access to the text object to obtain information and/or change or add the free-format data. This arrangement obviates the need for the provision of separate database fields for each element of the information. Free-format data can therefore be processed in a similar manner to the way a human being processes free-format data. All elements can be accessed via the constructed text object.

39 Claims, 22 Drawing figures

L23	syntactic near hierarch$	11	L23
L22	L21 and syntactic near hierarch$	2	L22
L21	text near object	2901	L21
L20	707/102	3941	L20
L19	707/513	2050	L19
L18	707/541	131	L18
L17	707/531	802	L17
L16	707/541	131	L16
L15	717/107	175	L15
L14	715/541	97	L14
L13	715/531	701	L13
L12	715/513	1233	L12
L11	704/8	621	L11
L10	704.clas.	16140	L10
L9	715.clas.	7202	L9
L8	717.clas.	5516	L8
L7	707.clas.	18127	L7
L6	707/100	3968	L6
L5	707/4	3258	L5
L4	707/3	5539	L4
L3	707/101	2847	L3
L2	707/1	5695	L2
L1	707/9	1881	L1

END OF SEARCH HISTORY